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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/581,791	06/06/2006	Mark Lawrence Williams	1033963-000025	5493

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EXAMINER

ANDREWS, LEON T

ART UNIT	PAPER NUMBER
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2462

NOTIFICATION DATE	DELIVERY MODE
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08/30/2011

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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Office Action Summary	Application No. 10/581,791	Applicant(s) WILLIAMS, MARK LAWRENCE	
	Examiner LEON ANDREWS	Art Unit 2462	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 June 2011.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 5) ☒ Claim(s) 1-9 is/are pending in the application.
- 5a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 6) ☐ Claim(s) ____ is/are allowed.
- 7) ☒ Claim(s) 1-9 is/are rejected.
- 8) ☐ Claim(s) ____ is/are objected to.
- 9) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 12) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Objections

1. **Claim 7-8, line 2** recited the optional language “operative to”. In order to present the claims in a better form and to describe positive or required steps/functions to be performed, applicant is suggested to revise the claim language such that the steps/functions which followed “operative to” are required and not optional.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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3. **Claims 1-2 and 5** are rejected under 35 U.S.C. 103(a) as being unpatentable by Admitted Prior Art (hereinafter APA) of the application, Williams (Pub. No.: US 2008/0310426 A1) in view of Rui et al. (Pub. No.: US 2004/0220769 A1).

Regarding Claims 1 and 5, APA discloses a network and a method for estimating a system state, the network comprising a plurality of nodes, each node having means for receiving and sending information and means for processing information, and each node being connected to selected other of the network (network where each node is connected for receiving and transmitting to other neighbouring nodes including the processing of information at each node and an estimate of the system state is maintained, [0003], [0008], page 1, lines 3, 1-6), each node including:

particle filter means for maintaining a set of particles and associated weights, which represent an estimate of the system state, and means for updating the set when new information is available (particle filter where set of particles representative of system state where weight is assigned to each particle and estimate of the state is by the weighted particles with update at time of availability, [0003], page 1, lines 1-14),

means for representing the estimating system state as a mixture of Gaussian distributions, and means for communicating said mixture to neighbouring nodes (set of particles representative of a system state where the state with observations have Gaussian function, and the network wherein each node receives and transmits information to neighbouring nodes, [0004], [0008], page 1, lines 1-5, 1-4),

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said means for updating, being responsive to receiving said mixture from a neighbouring node, for updating its estimate of the system state (update at time the system becomes available to update the particles representative of the system state where weight assigned to each particle and an estimate of the state obtained by the particles distribution function with the particle filtering by means of observation with sensors have the Gaussian measurement function and processing carried out at the nodes and exchanged between neighbouring nodes, [0003], [0004], [0012], page 1, lines 3-16, 1-5, 2-5).

APA fails to specifically disclose estimated state as a mixture of Gaussian distribution.

But, the Rui et al. discloses estimated states are in the form of Gaussian distribution, paragraph [0012], page 2, lines 1-5.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use Rui et al.'s limitation because this would have allowed the state estimates to be in the form of Gaussian distribution, paragraph [0012], page 2, lines 4-5.

Regarding Claim 2, APA discloses a method of claim 1, wherein said updating, at each node, is carried out by resampling the particles comprising providing new weights for each particle comprising a said mixture of Gaussian distributions received from the neighbouring node, divided by said mixture of Gaussian distributions formed from the existing particle set in the node (update resampling particles with weight where the particle have Gaussian measurement function and new weights are assigned to each particle according to the state given in the

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measurement calculated in the phase with the particle processing carried out at the node, [0003], [0004], [0012], page 1, liens 13-16, 1-13, 2-5).

APA fails to specifically disclose estimated state as a mixture of Gaussian distribution.

But, the Rui et al. discloses estimated states are in the form of Gaussian distribution, paragraph [0012], page 2, lines 1-5.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use Rui et al.'s limitation because this would have allowed the state estimates to be in the form of Gaussian distribution, paragraph [0012], page 2, lines 4-5.

4. **Claims 3 and 8-9** are rejected under 35 U.S.C. 103(a) as being unpatentable by Admitted Prior Art (hereinafter APA) of the application in view of Rui et al. and Mookerjee et al. (Patent No.; US 7,180,443 B1).

Regarding Claims 3 and 8, APA discloses a network and a method, wherein said means for communicating is operative to transmit each Gaussian distribution of said mixture as signals representing the mean and covariance of the distribution.

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The combination of APA and Rui et al. fails to specifically disclose Gaussian distribution defined to have covariance achievable by the weighting the states with measurement at each update, column 9, lines 14-23, Fig. 3, 326, update state estimate, covariance.

But, the Mookerjee et al. discloses Gaussian distribution defined to have covariance achievable by the weighting the states with measurement at each update, column 9, lines 14-23, Fig. 3, input covariance 316, update state estimate, covariance 326.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use Mookerjee et al.'s limitation because this would have allowed the Gaussian distribution defined to have covariance, column 9, lines 14-20.

Regarding Claim 9, APA discloses a network as claimed in claim 5, wherein each node is a sensor (each node corresponds to a sensor, [0012], page 1, lines 3-4) for tracking aircraft.

The combination of APA and Rui et al. fails to specifically disclose node for tracking aircraft.

But, the Mookerjee et al. discloses Fig. 1, tracking system tracks an aircraft target 12 using a radar system (sensor), column 1, lines 18-20.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use APA's limitation because this would have allowed the radar system (sensor node) to track an aircraft, column 1, lines 18-19.

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5. **Claims 4 and 6** are rejected under 35 U.S.C. 103(a) as being unpatentable by Admitted Prior Art (hereinafter APA) of the application in view of Rui et al. and Behroozi (Pub. No.: US 2005/0226179 A1).

Regarding Claims 4 and 6, APA et al. discloses a network and a method, wherein a communication port of each node includes a channel filter.

The combination of APA and Rui et al. fails to specifically disclose node includes channel filter.

But, Behroozi discloses node includes channel filtering, [0025], page 2, lines 1-2.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use Behroozi's limitation because this would have allowed the node to provide filtering of the signal, [0025], page 2, lines 8-10.

6. **Claim 7** is rejected under 35 U.S.C. 103(a) as being unpatentable by Admitted Prior Art (hereinafter APA) of the application in view of Rui et al. and Behroozi.

Regarding Claim 7, APA discloses a network of claim 6, wherein said channel filter is operative to compute new weights for each particle in a resampling operation, the new weights comprising said mixture of Gaussian distributions communicated to the node, divided by said mixture of Gaussian distributions representing the existing particle set at said node (resampling particles with weight where the particle have Gaussian measurement function and new weights

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are assigned to each particle according to the state given in the measurement calculated in the phase with the particle processing carried out at the node, [0003], [0004], [0012], page 1, lines 13-16, 1-13, 2-5).

The combination of APA and Behrooz fails to specifically disclose mixture of Gaussian distribution.

But, the Rui et al. discloses estimated states are in the form of Gaussian distribution, paragraph [0012], page 2, lines 1-5.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use Rui et al.'s limitation because this would have allowed the state estimates to be in the form of Gaussian distribution, paragraph [0012], page 2, lines 4-5.

Response to Arguments

7. Applicant's arguments filed June 9, 2011 have been considered. But, the arguments are moot in view of the new grounds of rejections with the use of new prior art in the current prosecution of the claims.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to LEON ANDREWS whose telephone number is (571)270-1801. The examiner can normally be reached on Monday through Friday 7:30 AM to 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rao S. Seema can be reached on (571) 272-3174. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Leon Andrews/
Examiner, Art Unit 2462
August 23, 2011

/Kevin C. Harper/
Primary Examiner, Art Unit 2462